The Resource
for Environmental Education in Missouri

February 2001 • Vol. 3 • No. 3

Photo by Paul Childress

What's in it for you?

An entire issue on

Waste Reduction!

Out of Sight, Out of Mind

By Dennis D. Hansen, Planning Unit Chief, Solid Waste Management Program and James D. Lubbers, Environmental Education Specialist, Technical Assistance Program, Missouri Department of Natural Resources

A radio story that aired a few years ago told of a computerized language translator. The phrase "out of sight, out of mind" was translated by the computer into French. The French version was then re-entered and translated back into English, resulting in the phrase "blind idiot."

When it comes to solid waste, "out of sight, out of mind" describes the typical attitude. When we throw an item "away," we rarely think about where it goes, what happens to it or what effects it has on the environment, other organisms or humans. We can do better. Making wise choices about what we purchase and discard is essential to reducing the amount of waste we generate.

Reducing Waste

Missouri is no exception when it comes to creating waste. It is estimated that in 1999, Missourians generated about 9.5 million tons of waste, about two million tons more than was generated in 1990. Now for the good news: about 3.4 million tons or 36 percent of Missouri's 1999 wastes were diverted from landfills. The diverted waste was reduced, reused, recycled or composted. This is a significant increase from the 10 percent diversion rate in 1990.

The increase in diversion is a result of Missouri's commitment to an integrated approach to waste management. Missouri uses a hierarchy of alternatives to lessen dependence on landfills (see graphic on page 2). In order of preference, these alternatives include waste reduction, materials reuse, recycling and composting. When these alternatives are exhausted, unavailable or impractical, alternatives that include incineration and landfills are used.

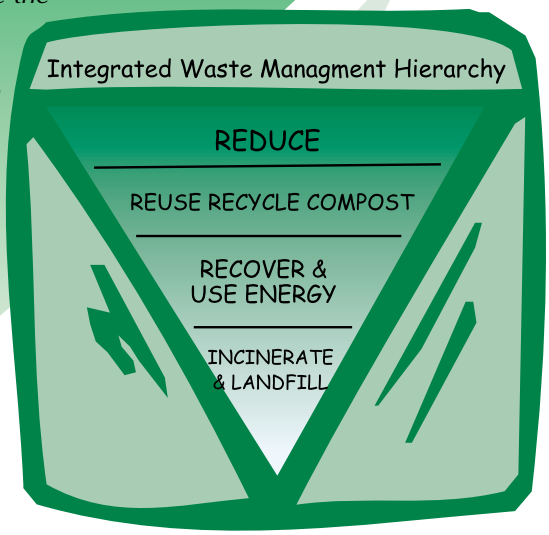
Encouraging production of goods that use recycled or recovered materials is a major part of managing solid waste. The key to keeping the momentum going for waste reduction is to work together to demand products that use recovered materials. This consumer-based approach is referred to as "buying recycled" and helps stimulate industrial markets for recovered materials, which should in turn reduce the amount of solid waste needing disposal.

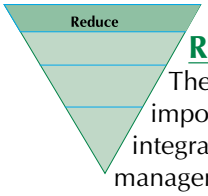
continued on page 3...

Trek for Trash!

Field trips offer students a great opportunity to see the waste cycle in action! Here are some tips and ideas to get you started in your trek for trash. Check with your city or county solid waste offices for more information on local field trip destinations.

Each triangle icon indicates which option from the integrated waste management hierarchy is emphasized.



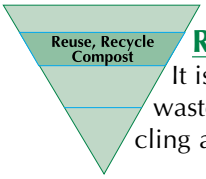


REDUCE

The most important step in the integrated waste management hierarchy is reducing the amount of waste produced. Have students write down everything they throw away in a day, and then list the ways they could have reduced their amount of waste.

Packaging

Visit your local grocery store and compare packaging options (see activity on page C-4).



REUSE, RECYCLE, COMPOST

It is possible to prevent large volumes of waste from reaching a landfill by reusing, recycling and composting.

Resale Shops

Antique stores, thrift shops and garage sales are all examples of resale in action. By supporting these ventures, usable items are not added to the landfill.

Businesses that use recycled-content materials in manufacturing

Canbrands Products Division of Ralston Purina Company
2555 Partnership Blvd, Springfield, MO 65803
Diane LeBlanc, Assistant to the President, 506/856-8023
Uses newsprint and mixed paper from local recycling centers to manufacture an internationally-distributed line of animal litter and bedding products including "Yesterday's News" cat litter and Ralston Purina's new "Secondnature" dog litter.

Museums

Museums offer students hands-on learning experiences. Check around to find those that offer exhibits on recycling and composting.

Van Go Traveling Recycle Center
636/227-7095,
<http://www.stlouisteachersrecycle.homestead.com>
The St. Louis Teachers' Recycle Center, Inc. gathers material from local businesses and industry that is landfill-bound and makes it available to teachers, parents and youth groups. Its traveling recycle center, Van Go, can schedule a stop at your school and bring bags of unburied treasures suitable for little hands to create Starry Nights and Sidewalk Cafes.

The City Museum
701 N. 15th Street, St. Louis, MO, 314/231-2489,
<www.citymuseum.org>
Housed in a former shoe factory in downtown St. Louis, most exhibits were created from recycled items. Artists hold classes and create art from recycled materials in the recycling studio.

Household Hazardous Waste Disposal Sites

Learn about the environmental and health hazards of many common household items (including paint, batteries and cleaning supplies).

Household Hazardous Waste Collection Facility
Cynthia Mitchell, Waste Minimization Coordinator, Public Works Department, City of Columbia, 573/874-6254
Accepts household generated chemical waste. Nearly 80% of the material collected is recycled or reused. The balance is disposed in an environmentally friendly manner.

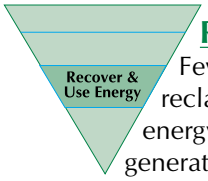
Recycling Centers

Visit your local recycling center to see what happens to recycled goods. Why is it important to sort your items? Why are some items recycled more often than others?

Compost Demonstration Sites

Many cities have composting and yard waste sites. Students can view compost in different stages of completion and learn why yard waste is banned from many landfills today.

Springfield Yardwaste Recycling Center
Barbara Lucks, Materials Recovery/Education Coordinator Public Works Department, City of Springfield, 417-864-2005
View this efficient and convenient process. Residents bring yardwaste and brush and may take home high-grade wood mulch and compost.



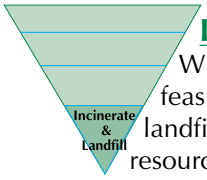
RECOVER AND USE ENERGY

Few people realize that energy can often be reclaimed from waste. One way to recover energy is by using the incineration process to generate steam and electricity. Another involves using the methane naturally produced in a landfill to heat nearby businesses and schools.

Waste-to-Energy Sites

Pattonville High School heats its building using methane produced from the nearby Fred-Weber Landfill (see page 4)

Pattonville High School
2497 Creve Coeur Mill Road, Maryland Heights, MO 63043, 314/213-8051



INCINERATE AND LANDFILL

When options are exhausted or simply not feasible, waste is sent to an incinerator or landfill for long-term disposal. Here wasted resources are taken "out of the loop."

Sanitary Landfills

Landfills are the final resting place for many unwanted objects. A visit to a landfill can illustrate the differences between modern sanitary landfills and old-fashioned dumps.

City of Columbia Sanitary Landfill and Compost Facility
5700 Peabody Road, Columbia, MO, 573/886-0722, Mark Russell, Superintendent

Making the Most of Your Trek for Trash:

- Help students understand the big picture. Have students explain how the field trip destination fits into the Integrated Waste Management Hierarchy.
- Prepare students for field trip - have them write down preconceived thoughts about what they expect and be sure to follow-up from their own experience.
- Tie in the field trip experience with science or social studies lessons (i.e., watershed and landfill technology vs. dumps of yesteryear).
- Keep it local/regional – students gain more history of the area and discover the growth and/or decline of the environment, economy and population.

Out of Sight, Out of Mind

...continued from cover

What about landfills?

Years ago, when something was "thrown away," it usually went to a local dump. These dumps were not covered and were burned periodically. Pests thrived and created health problems by spreading disease. Odors from uncovered or burning trash were a public nuisance and damaged air quality. All of Missouri's dumps were closed in the 1970s and replaced by regulated, sanitary landfills.

Today, sanitary landfills must be sensitive to the environment because of stringent state and federal pollution prevention standards. It may take up to five years to complete the permitting process. To obtain a permit, registered professional engineers must design the landfills in ways that minimize the potential for environmental damage. The review process is lengthy and thorough and is conducted by environmental engineers, geologists and other scientists.

When landfill permit applications are considered, the Department of Natural Resources also seeks input from area residents at public involvement sessions. This gives the applicant and the department an opportunity to understand and take into account local citizens' concerns during the design phase of the permitting process.

Once a landfill is permitted and is accepting trash, the department inspects it quarterly. If the landfill is polluting the environment, or if there are other violations, the department takes enforcement action against the operator to correct the problem.

Today's landfills are a safe option, and they will be needed for much of Missouri's trash for some time to come. While landfills are necessary for disposing of waste that can't be reduced, reused, recycled or composted, they should not be the first choice for waste management. Instead, we should maximize the higher levels of the integrated waste management hierarchy.

Education: The future

Each of us has a responsibility to reduce the amount of waste we generate. We can reevaluate our actions and choose alternative pathways if we learn more about **what** we throw away, **how much** we throw away, the **sources** of waste and management options. Today, with the 2000-acre Fresh Kills landfill on Staten Island, New York being visible from space with the naked eye, waste is no longer out of sight. It should not be out of mind either.

This issue of The Resource *provides you with a snapshot of some of the programs and resources available to you. For additional information, contact any of the sources listed or call the Missouri Department of Natural Resources at 800/361-4827.*

Schools Take Action!

Case Studies Showcase Waste

Many schools take a pro-active approach towards waste reduction. Here are several examples from around the state. Each triangle icon indicates which option from the integrated waste management hierarchy is emphasized.

PETE, Worms and Kids

Parkway North High School, Andy Duggan (high school science), 12860 Fee Fee Road, St. Louis, MO 63146, 314/415-7600, **<a.duggan@pkwy.k12.mo.us>**

Students from the ecology class led a waste reduction program that included recycling, composting and peer teaching to minimize their school's waste. Responding to the proliferation of plastic bottle vending machines, students institutionalized recycling PETE (polyethylene terephthalate) bottles by developing an advertising campaign and implementing a new collection system. Through the use of vermicomposting (five worm bins), students diverted 5-10% of the daily salad bar waste from the school's dumpster. Students also visited fourth grade classes at local elementary schools to increase awareness and participation in reducing, reusing and recycling around their school district.

We Think We Can, We Think We Can!

Wydown Middle School, Janet Crews (6th grade science), 6500 Wydown, Clayton, MO 63105, 314/726-5222, **<JanetCrews@clayton.k12.mo.us>**

Since paper makes up 50-60% of a school's trash, and the paper recycling program had minimum participation from the previous year, the environmental club reenergized their school's enthusiasm and commitment to recycle paper. They were working with a new hauler that collected a wide range of paper types, so it was necessary to reeducate students and staff alike. The club members created posters, met with the PTO and wrote articles for the school newspaper to encourage support. They even began a curbside drop-off on Fridays outside the school to gain parent participation. As a school-wide goal of two tons of paper collected in one month, the club rewarded fellow students' participation with a DJ at lunchtime.

Earth Savers

Parkwood Elementary School, St. Louis, MO, for information contact Jean Ponzi, 314/577-5100, **<jean.ponzi@mobot.org>**

A group of dedicated students volunteer their time and efforts one hour every Tuesday after school to reduce waste at their school. The Recycling Committee focused on paper recycling and a school book drive. Classes that participated in recycling got their name placed in a drawing for a book to add to their class library. The Special Projects Committee collected over 300 toys for their Recycled Toy Drive for Christmas. They cleaned, repaired and replaced parts to renew the toys, and then donated them to a charitable agency. Students also developed awareness school-wide through a Waste-Free Lunch campaign. Students sold cloth napkins and reusable lunch bags and rewarded students for using these items throughout the year.

Trash to Treasure

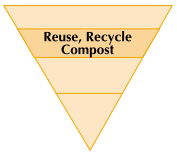
Pattonville School District, Bob Vahey (Facilities Project Supervisor), 314/213-8041, **<vaheyr@pattonville.k12.mo.us>.**

The Ecology Club at Pattonville High School in Maryland Heights helped develop the idea to use methane gas from a nearby landfill to heat their school. The school district paid $170,000 for equipment conversion and its portion of a 3,600 foot pipeline between the landfill and the school's two basement boilers. In turn, the landfill owner (Fred Weber Inc.) spent an additional $220,000 and donated the methane to the school as a way of giving back to the community. The school saves approximately $40,000 each year. For more information about similar projects, visit **<http://www.epa.gov/lmop/about.htm>**.

These case studies are part of the Leadership in Environmental Action Program (LEAP) sponsored by the Gateway Center and Bridging the Gap (see page 6).

Reducing Students

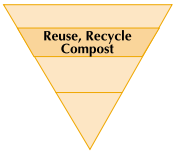
We Aim to Recycle!



North Rock Creek/Korte Elementary Academy of Environmental Studies, Jody Bay (science resource teacher), 2437-2431 S. Hardy, Independence, MO 64052, 816/418-4450

Students recycle paper and aluminum cans in addition to reusing materials in art and other academic subject areas. From September through November, the school recycled 17 cubic yards of paper, earning $24 in September from the recycling company. Aluminum cans are collected four times a year. Students rinse, count and bag cans at home. If a student brings in 500 cans, they become a member of the "500 Can Club." Their picture is placed in the front hall, and they are invited to a special activity. A local recycling company in Kansas City brings a semi trailer one week each quarter. Second grade students help load the aluminum cans. The money earned ($1000-$1300 annually) is used to purchase supplies for classroom animals and hallway aquariums.

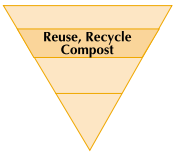
Friends of the Environment



English Landing Elementary, Terri Stutz (kindergarten teacher, Ecology Club sponsor, LEAP team facilitator), 6500 NW Klamm Drive, Kansas City, MO 64151, 816/741-0661, **<stutzt@parkhill.k12.mo.us>**

The Friends of the Environment Club is composed of 6, 7 and 8 year olds and lead by 5th graders who are participants in the LEAP program. Recently, the club conducted a special project for America Recycles Day at a local grocery store. Students gathered all products in the store made from recycled materials to make a display encouraging shoppers to buy recycled. English Landing Elementary also features a sculpture in the front lobby made entirely from recycled materials.

Large-Scale Composting



Lange Middle School, John Reid, 2201 E Smiley Lane, Columbia, MO 65202, 573/886-4850, **<jreid@columbia.k12.mo.us>**

Students at Lange Middle School are building productive relationships with the community while studying environmental issues. Donations of lumber and topsoil from local companies were used to build the outdoor garden area four years ago. Shredded oak pallets from a local recycler surround the raised beds, prairie, butterfly garden and compost area. The Main Squeeze vegetarian restaurant donated over two tons of food scraps to mix with leaves in the compost bins to produce compost that out-performed worm castings in a study done by students this year. Worm castings from the class worm farm and the outdoor compost area have helped to raise over one-hundred pounds of lettuce for the local food bank. Students collect seeds from heirloom plants each year to use the following spring. They take their message of composting and organic gardening to local elementary schools and community events, passing out free seeds and compost samples.

becoming an Outdoors-Woman

Register now for this May 18-20 workshop offering women the opportunity to learn new outdoor skills. Learn how to read a map, shoot a shotgun, cook in a Dutch oven, hunt turkey or paddle a kayak. Minimum age to attend is 18. $170 fee includes food, lodging, instruction and equipment. Partial scholarships are available. Contact Mariah Hughes, Missouri Department of Conservation, 573/751-4115, **<hughem@mail.conservation.state.mo.us>**.

Audubon Adventures

A limited number of Audubon Adventures kits are available to 4-6 grade teachers in the Kansas City area. Kits are purchased by the Burroughs Audubon Society of Kansas City and contain four sets of nature newspapers for each of your students, a teacher's manual and video. Newspaper topics for this year include Living Oceans, Nature's Banquet, Owls and Endangered Species. Contact: Kelly Gillespie, PO Box 363, Peculiar, MO 64078, **<kellyg363@juno.com>**.

AUDUBON ADVENTURES
NATIONAL AUDUBON SOCIETY

WASTE REDUCTION EXPERTS are here to help YOU!

The following organizations offer resources and educator support on waste reduction issues. Visit their respective websites or make a phone call to find out how they can help you! Your local community may also have resources available.

Bridging the Gap

P.O. Box 10220, Kansas City, MO 64171, ***<www.bridgingthegap.org>, <www.environ-excellence.org>***
A Kansas City based not-for-profit organization that unites businesses, local government and citizens in a search for solutions to environmental problems. One of BTG's premier programs is Choose Environmental Excellence, a free program that offers materials and experience to people trying to affect change in their own communities! Seven CEE communities now exist in Missouri, serving over 85% of the state's population.
Programs: Choose Environmental Excellence, Environmental Excellence Business Network, Community Drop-off Recycling Centers, Earth Day, Leadership in Environmental Action Projects (LEAP)
Outreach Potential: Kansas City metro area, statewide
Contact Person: Brian Alferman, **<brian@bridgingthegap.org>**

City of Springfield; Division of Solid Waste Management

840 Boonville Avenue, Springfield, MO 65802, 417/864-2005, Recycling Hotline: 417/864-1904, ***<springfield.missouri.org/gov/recycling>***
Implements and maintains Springfield's voter-approved Integrated Solid Waste Management Plan.
Programs: Recycling centers, Household Chemical Collection Center, Yardwaste Recycling Center, Market Development Program, Information and Education Program
Outreach Potential: City of Springfield, Greene County and Waste District "O" which includes: Greene, Christian, Polk, Dallas, and Webster counties, depending upon the program
Contact Person: Barbara Lucks, Materials Recovery/ Education Coordinator, **<Barbara-Lucks@ci.Springfield.mo.us>**

DNR's Solid Waste Management Program

P. O. Box 176, Jefferson City, MO 65102, 573/751-5401, ***<www.dnr.state.mo.us/deq/swmp/homeswmp.htm>***
Helps Missourians properly manage their solid waste to protect public health and the environment. Reducing solid waste destined for landfills is the program's primary goal.
Programs: ReSource Your Waste (see page C-1), Travelin' Trash Kit (see page C-8)
Outreach Potential: Statewide
Contact Person: Jim Lubbers, **<nrlubbj@mail.dnr.state.mo.us>**

Gateway Center for Resource Efficiency

a division of the Missouri Botanical Garden
at The EarthWays Home, 3617 Grandel Square, St. Louis MO 63108, 314/577-5100, ***<www.mobot.org>, <www.resourcefulschools.org>***
The Gateway Center, formerly MERP, teaches children and adults how to reduce, reuse and recycle economically and efficiently, providing educational and technical support to schools, businesses and community organizations.
Programs: Leadership in Environmental Action Projects (LEAP), School Energy Efficiency Development (SEED), St. Louis County Resourceful Schools Project, tours of the EarthWays Home
Outreach potential: St. Louis Metro area, with programs available for transplant around the state, utilizing local grant funds
Contact person: Jean Ponzi, Program Manager, **<jean.ponzi@mobot.org>**

Household Hazardous Waste Project

University of Missouri Outreach & Extension, 1031 E. Battlefield, Suite 224-B, Springfield, MO 65807, 417/889-5000, ***<outreach.missouri.edu/owm/hhw.htm>***
Promotes the safe use, storage and disposal of hazardous materials. HHWP's educational programs target students and teachers, community officials, decision-makers and anyone who lives in a household!
Educational Programs: From Awareness To Action! On-line household hazardous waste issues training course, guidesheets, lessons for K-3 and 4-8, technical bulletins and interactive website activities
Outreach Potential: Statewide and beyond
Contact Person: Marie Steinwachs, **<owm@missouri.edu>**

Missouri Recycling Association

P.O. Box 2144, Jefferson City, MO 65102, Toll-Free 866/667-2777, ***<www.mora.org>***
Supports waste reduction and recycling efforts throughout Missouri by providing information, educational opportunities and technical support in partnership with state, national and regional organizations.
Programs: Missouri Recycles Day, annual conference, workshops
Outreach Potential: Statewide
Contact Person: Kristin Allan, **<nrallak@mail.dnr.state.mo.us>**

St. Louis Teachers Recycle Center

12225 Eddie and Park Road, St. Louis, MO 63127, 314/729-2401, ***<www.stlouisteachersrecycle.homestead.com>***
A non-profit organization that gathers manufacturing waste items and business surplus materials for use in educational settings, the SLTRC is committed to improving educational opportunities while protecting the environment. Provides education that fosters learning through play, using diverse "unburied treasure" materials. As part of a national network of "Reuse Centers," SLTRC can help set up a Teachers Recycle Center in your area!
Programs: Hands, Heart and Mind workshops for teachers, students and community events, Van Go Traveling Recycle Center
Outreach Potential: St. Louis metro area, with statewide options.
Contact Person: Susan Blandford, **<sltrc@juno.com>**

Project Resource Guide: Waste Reduction

Are you wondering how PLT, WILD, WET and LEP fit into this issue's theme? Well, wonder no more! We have combed each project for activities that deal with waste reduction. So, open those books and use them to your advantage. If you do not yet have these materials, sign up for a workshop by contacting the coordinators listed below.

Project Wild

Project WILD: K-12 Activity Guide

Litter We Know – **Page 50** – Collect and evaluate litter, making collages.
No Water Off a Duck's Back – **Page 274** – Identify ways oil spills can affect birds adversely.
What Did Your Lunch Cost Wildlife? – **Page 306** – Trace foods from their source to the consumer, identifying environmental impacts.

For more information on Project WILD and PLT workshops and materials, contact: Bruce Palmer, State Coordinator, Missouri Dept. of Conservation, PO Box 180, Jefferson City, MO 65102-0180, (573) 751-4115 extension 3113, ***<palmeb@mail.conservation.state.mo.us>****.*

Project WET

Project WET Curriculum and Activity Guide: K-12

A-maze-ing Water – **Page 219** – Guide a drop of water through a maze of "drainage pipes" to learn how actions in the home and yard affect water quality.
Sum of the Parts – **Page 267** – Demonstrate how everyone contributes to the pollution of a river as it flows through a watershed.
A Grave Mistake – **Page 311** – Analyze data to solve a mystery and identify a potential polluter.

For more information on Project WET workshops and materials, contact Joe Pitts, State Coordinator, Missouri Dept. of Natural Resources, Technical Assistance Program, PO Box 176, Jefferson Ctiy, MO 65102, (800) 361-4827.

Leopold Education Project

Leopold Education Project: Striving for a Land Ethic

Come High Water – **Page 16** – Find alternate uses for objects salvaged from a river or garbage heap.

For more information on LEP workshops and materials, contact Janice Greene, State Coordinator, Biology Dept., Southwest Missouri State University, 901 S. National Ave., Springfield, MO 65804, (417) 836-5306 or at ***<JaniceGreene@mail.smsu.edu>***

Project Learning Tree

Project Learning Tree Environmental Education Activity Guide: Pre K-8

Talking Trash, Not! – **Activity 37** – Learn about how and why people throw things away.
Make Your Own Paper – **Activity 51** – Investigate the papermaking process.
A Look at Aluminum – **Activity 52** – Learn the steps and environmental impact of making aluminum products.
Resource-Go-Round – **Activity 82** – Gain insight into the processes by which natural resources are turned into products and recycled into new products.
Reduce, Reuse, Recycle – **Activity 83** – Set up a program for reusing, recycling and reducing consumption of resources at school.
A Peek at Packaging – **Activity 84** – Examine the pros and cons of different packaging strategies.

Project Learning Tree Module. Exploring Environmental Issues: Municipal Solid Waste
Emphasizes the importance of understanding waste management issues and options. This module uses hands-on experiences to show the interrelationships among waste generation, natural resource use and disposal. Activities guide students through the various waste management strategies and solutions while providing the necessary tools to make informed decisions and choices on waste management issues. Grades 9-12.

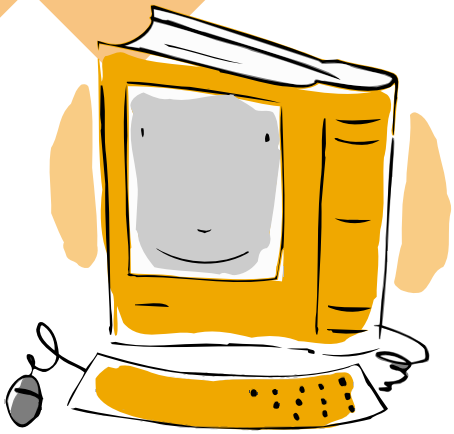
Thank you!

The Missouri Environmental Education Association (MEEA) would like to thank all who participated in the 5th Annual Conference on Environmental Education. We feel that the November conference was one of the best, with almost 350 attendees, a wonderful program and widespread involvement of students. For more information on MEEA and how to join, visit **<http://www.meea.org>** or contact Jim Lubbers, 573/526-6627.

The Library

Conservation and Environmental Education Resources

You won't find a shortage of educational materials on waste reduction Check out these for some good ol' 3R's education.



WEB RESOURCES

The Cygnus Group
<http://cygnus-group.com/>
Provides information on ways to reduce waste and conserve resources. Focuses on source reduction and reuse rather than just recycling. Resources include an online newsletter "The ULS (Use Less Stuff) Report" and "An Ounce of Prevention," a middle school curriculum developed with the National Science Teachers Association.

Educational Resources for Solid Waste Management
<http://www.cfe.cornell.edu/wmi/GenInfo/EdRes2000.html#anchor239441>
Describes more than 40 books, brochures, website links and videos on solid waste management. The list is divided into categories including composting, school and youth, enviroshopping, waste prevention and sewage sludge. Nearly all of the listed resources can be ordered from the Cornell University Resource Center, 607/255-2080.

EPA Office of Solid Waste Students' and Teachers' Page
<http://www.epa.gov/epaoswer/osw/students.htm>
Information and activities on solid waste education, service learning projects and environmental careers. Selected resources are also available in Spanish.

The Internet Consumer Recycling Guide
<http://www.obviously.com/recycle/>
Includes thorough instructions for stopping junk mail, including credit card offers, catalogs, internet service offers and the prolific sweepstakes invitations.

Missouri Recycling Association
<www.mora.org>
Supports waste reduction and recycling efforts in Missouri by providing information, educational opportunities, and technical support in partnership with state, national and regional organizations. Click on "Teachers and Recycling" to view several classroom activities including a solid waste audit entitled "What's in Your Trash Bag?"

The Resourceful Schools Project - St. Louis, Missouri
<http://www.resourcefulschools.org/>
Learn how to set up a recycling program in your school or district. This program currently demonstrates and quantifies waste reduction in schools that collect recyclable paper. Great teacher links.

Recycling Goes to School
<http://www.dep.state.pa.us/see%26hear/interactive/recy2school.htm>
On-line video that shows how several Pennsylvania school districts are reducing the amount of waste they send to landfills while at the same time cutting their disposal costs (Real Video software required). Web links are included for more information on recycling.

Tennessee Solid Waste Education Program
<http://eerc.ra.utk.edu/tnswep/default.html>
More than 100 solid waste activities for grades K-12! Includes links to other solid waste web pages and an on-line newsletter devoted to solid waste education.

PUBLICATIONS

Composting in the Classroom: Scientific Inquiry for High School Students
A manual for teachers interested in using composting as a topic for scientific inquiry by high school students. Includes sample research topics, guidelines for directing student research, and instructions for techniques related to compost science. 1998. $24.95. Can be ordered from any bookstore, or directly from Kendall/Hunt Publishing Company, PO Box 539, Dubuque, IA 52004,
1-800-228-0810 (US) or 1-319-589-1000 (International),
ISBN 0-7872-4433-3.

Closing the Loop: Integrated Management Activities for School and Home
Applies K-6 level project-based learning to examine integrated waste management and resource conservation issues. Topics include alternatives to incineration, audits of students' homes for waste and toxics, consumer attitudes, vermicomposting and the properties of recyclable plastics. $15. California Integrated Waste Management Board, Public Education and Assistance Section, 8800 Cal Center Drive, Mail Station 5, Sacramento, California 95826, **<http://www.ciwmb.ca.gov/Schools>**.

Worms Eat Our Garbage: Classroom Activities for a Better Environment
Appelhof, Fenton, Harris. Over 150 activities divided into three chapters: "The World of Worms," which explores worm anatomy, size, natural history and behavior; "Worms at Work," which addresses the use of worms in decomposing garbage; and "Beyond the Bin," which focuses on

garbage, solid waste, recycling and other related topics. Activities are presented as student worksheets, most of them only one page in length. Grades K-12. $22.95 + S&H. Flower Press, 10332 Shaver Road, Kalamazoo, Mi 49024, 616/327-7009, **<http://www.wormwoman.com>**.

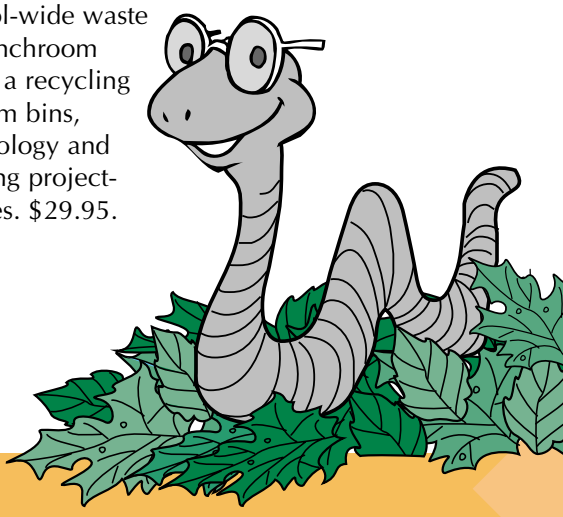
The following publications (and many other waste reduction resources) are available from Acorn Naturalists, 17821 East 17th Street, Suite 103, PO Box 2423, Tustin, CA 92781-2423, 800/422-8886, Fax 800/452-2802, <http://acornnaturalists.com>.

Environmental Action, Waste Reduction
Awareness moves toward action as students investigate solid waste management strategies, including source reduction and recycling. Students conduct waste management audits, analyze costs and propose practical local solutions. Grades 6-12. Teachers Resource Guide: $13.95. Student Workbook: $5.95.

Packaging and the Environment: Real-World Mathematics through Science
Johnson. Middle school students discover surface-area and volume formulas as they design and construct boxes of different shapes. Studying exponents, estimation, percents and multiple variables, students learn to solve problems using math as a tool. $16.10.

Understanding Garbage and Our Environment
Nolan. Students investigate solutions such as recycling, composting and source reduction while exploring management and engineering issues at classroom "town meetings." Each motivating lesson includes cross-curricular extensions, safety tips and resources for further study. Grades 5-8. $16.95.

The Worm Café, Mid-Scale Vermi-composting of Lunchroom Waste
Payne. Describes how an enthusiastic teacher and her students developed a system to compost lunchroom waste with worms and ended up saving the school $6000/year in waste disposal fees. Includes instructions for conducting a school-wide waste audit, incorporating lunchroom waste composting into a recycling program, building worm bins, studying earthworm biology and ecology, and conducting project-based learning activities. $29.95.



Household Hazardous Waste Project <http://outreach.missouri.edu/owm/students.htm>

Every year, the Household Hazardous Waste Project (HHWP) receives hundreds of letters from children asking what they can do to help the environment. In response, HHWP has compiled a number of educational (and fun!) activities for pre-school on up designed to raise awareness and teach children to avoid hazardous products. Following is just a sample of what can be found at this website.

Pesticides pose particular hazards to children, yet most schools apply pesticides on athletic fields, landscaping, playgrounds, cafeterias, classrooms, restrooms and other parts of the facility. School Pesticide Use Reduction was developed to provide teachers, parents, groundskeepers and others with tools to develop safer pest control policies.

Students can complete an inventory of hazards in their own homes using the Home Hazardous Product Survey. All teacher support materials are provided including a letter to the parents and activities for calculating class averages and estimating the number of hazardous products in the community.

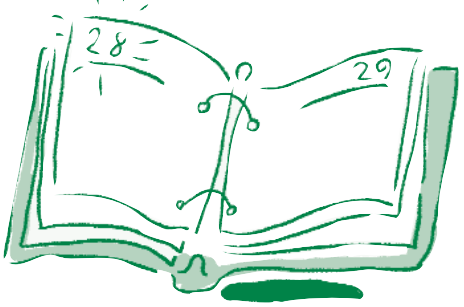
Art Hazards offers information for teachers on art hazards and products that should be avoided in schools. The list includes a number of commonly used art products: solvent-based markers, rubber cement, papier-mache, and powdered paints. There is also a manual detailing safety procedures for art departments and art schools (upper grade levels).

Tour the Virtual House to see what hazardous products are typically found in basements, garages, bathrooms and kitchens. Click on a product and learn about the hazardous ingredients, safe use, safe storage and disposal recommendations.

Safe Labs That Don't Pollute contains fully scripted lesson plans for "least-toxic" chemistry labs, information on ways to reduce chemical stockpiles in biology labs and perhaps most important — a list of chemicals whose risks outweigh their educational utility.

Teachers may enroll in the on-line continuing education course, From Awareness To Action! The self-paced course covers hazardous product identification, exposure and health effects, product label interpretation and more through University of Missouri Continuing Education and Distance Learning. The $135 registration fee includes all course materials and credits. To register, contact MU Direct at **<Mudirect@missouri.edu>**, phone 573-882-2851, or fax 573-882-5071. You can also register on-line at **<http://Mudirect.missouri.edu>**.

EE Calendar



February 10-11

Watershed as an Organizing Concept
Jefferson City
Provides teachers with an understanding of "watershed" as a framework for learning about water quality and quantity, managing water resources and for making responsible decisions. 1 hour graduate credit, Lincoln University ($60). $30 registration fee. Contact: Joe Pitts or Jim Lubbers at 800/361-4827 or 573/526-6627.

February 17

Spineless Wonders
Saint Louis Zoo, St. Louis
9:00 a.m. - 4:00 p.m. Teachers of grades K-3. Bring the wonder of invertebrates to life for your students. We will also provide information about maintaining animals in your classroom. "Bug" your co-workers to take this workshop with you. $15. Contact: Saint Louis Zoo, 314/768-5466.

February 22

Project WILD: Bringing the Environment into Your Classroom
Interface A (Teachers of grade K-6)
Auditorium, Tan-Tar-A Resort, Osage Beach, Noon- 6:00 PM
Learn to use Project WILD, an interdisciplinary environmental education program emphasizing wildlife and habitats. Receive the Project WILD and WILD Aquatic guides. Participants must register for Interface A. An additional fee of $15 must be paid in the session. Contact MU Conference Office 573/882-4087 for registration materials.

February 25

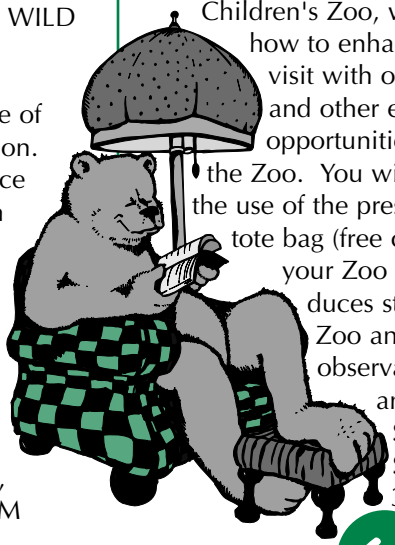
Missouri Project WET Water Education for Teachers
Interface B (Teachers of grades 6-12)
Auditorium, Tan-Tar-A Resort, Osage Beach, Noon - 6:00 PM
Participants will receive the Project WET Curriculum and Activity Guide, experience several activities from the Guide and practice using the activities. Participants must register for Interface B. An additional fee of $15 must be paid at the session. Contact MU Conference Office, 573/882-4087 for registration materials.

March 22-25

National Science Teachers Association Convention
St. Louis Convention Center
Approximately 18,000 educators are expected to attend this four-day event. For information, go to **<www.nsta.org>** and follow links for the 2001 convention. Of the hundreds of concurrent sessions and presentations, a significant number (10% or so), are categorized as primarily related to environmental education. One portion of the exhibit hall will be entirely devoted to environmental education and is known as "EE Street." Contact Jim Lubbers at **<nrlubbj@mail.dnr.state.mo.us>** for updates on this event.

March 31

Lions & Tigers & Bears, OH MY!
Saint Louis Zoo, St. Louis
9:00 a.m. - 11:30 a.m. Teachers of grades PreK-K. This Zoo tour/workshop, which includes the Children's Zoo, will show you how to enhance your Zoo visit with on-site activities and other educational opportunities that exist at the Zoo. You will be trained in the use of the preschool activity tote bag (free checkout during your Zoo visit) which introduces students to ten Zoo animals through observations, actions and manipulatives. $7. Contact: Saint Louis Zoo, 314/768-5466.



March 31-April 4

National Association for Interpretation, Region VI Workshop
Manhattan, Kansas
Interpretation training for historians, naturalist and educators. Provides workshops in outdoor and indoor interpretation techniques. Contact: Mark Morgan, Kansas State University, Manhattan, KS 66507, 785/532-1406, **<http://www.gpnc.org/nai.htm>**.

April 21

Earthfest 2001
Discovery Center, Springfield
Includes Steve Trash, zoo animals, environmental exhibitors, volunteer recruitment and one big environmental celebration. Free admission. Contact: Ann Carter, 417/862-9910, Ext. 701.

April 27-29

HOOT (Hands-On Outdoor Training)
YMCA of the Ozarks, Potosi
Here's an opportunity for the whole family to enjoy a weekend in the outdoors. Courses include canoeing, fishing, horsemanship, introduction to rifle and shotgun, outdoor cooking, climbing, and many more. Minimum age to attend is 4. Fee ranges from $50-150 per person depending on your choice of lodging. All fees include meals for the weekend. Contact: Mariah Hughes, Ken Sloan or Stephanie Upton, Missouri Department of Conservation, 573/751-4115, **<hughem@mail.conservation.state.mo.us>**.

Paper Facts

Environment Recycled Paper is made from Over 75% recycled paper including 25% post consumer fibre.

PRINTED WITH SOY INK™

ENVIRONMENTAL CHOICE · CHOIX ENVIRONNEMENTAL

Outside In Guide 5-8

Hug a Flower?

After reading "A Bouquet of Flowers" in the February issue of Outside In, discuss the importance of plants. The plant kingdom provides us with food, shelter, clothing, medications and oxygen to breathe. While many people feel a connection to animals that are endangered, endangered plant species are often overlooked, if not completely ignored.

The following exercise is from Plants in Peril, a publication by the Center for Plant Conservation. You may order a Missouri specific edition by writing to: Distribution Center, Missouri Department of Conservation, P.O. Box 180, Jefferson City, Missouri 65102-0180.

1. Have students read the following dilemma in groups of two or three and answer the following questions. This is a brief scenario and cannot possibly cover all the opinions and emotions of the people affected by the situation. For this reason, groups should identify what further information they feel they should know in order to draw conclusions or make recommendations. Also, have students identify all individuals or groups that should have input into the search for a solution.

2. Student groups can then look for similar issues in this week's newspapers. What issues are people trying to make decisions about? Who needs to be involved? Think about whether the news articles prey on peoples' emotions, as opposed to simply stating facts. The groups can then make decisions about how they would handle these issues.

Dilemma

Plans are underway to build a new swimming pool in your neighborhood. A site has been chosen that will be safe for kids arriving by bike and will provide enough space for an Olympic-sized pool. However, the state botanist has just issued a report that there is a small population of a very rare native plant on this site. Your community has already gone through a lengthy process to choose a site that would meet its needs and some people are upset that plans might be changed because of a handful of plants. People have suggested building around the plants or moving them to a safer area, but others worry that destroying the habitat could cause irreversible damage since these plants only grow in certain types of soil. Answer the following questions:

A) Who is potentially affected by this dilemma?
B) What would your community gain by saving the plants?
C) What else do you need to know to make the decision about whether or not you agree with the plans to build a pool on the site?
D) Would you feel differently if there was an endangered animal rather than a rare plant on the site? Why or why not?

To receive a classroom quantity of Outside In, write to Missouri Department of Conservation, "Missouri Conservationist" magazine, PO Box 180, Jefferson City, MO 65102-0180.

Special Edition

Natural Resources

Waste Reduction Curriculum

ReSource Your Waste

A Solid Waste Teacher's Guide

ReSource Your Waste is a collection of 23 lessons for learning about the management of solid waste in Missouri. It is designed to help teachers provide learning opportunities that promote the understanding and personal responsibility needed to reduce the amount of waste generated in Missouri. The activities are geared toward middle school but most of them can be adapted easily to other levels.

The guide is structured around four themes:

1. **Sources of Resources**
2. **Sources of Waste**
3. **Integrated Solid Waste Management**
4. **Managing Your Solid Waste**

Other Features:

- Developed with state and national standards in mind
- Focuses on decision-making and problem-solving skills
- Incorporates "learning cycle" elements
- Structure based on proven environmental education approach

ReSource Your Waste was produced through the Solid Waste Management Program and the Technical Assistance Program, Division of Environmental Quality, Department of Natural Resources. Nearly a thousand copies have been distributed to public school districts and interested individuals. Copies are free for the asking but please check with your school district personnel first. Call 1-800-361-4827 to request a copy.

Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

<http://www.dnr.state.mo.us/deq/swmp/homeswmp.htm>
e-mail: **<swmp@mail.dnr.state.mo.us>**

Worms in the Classroom

Background:
In 1999, it is estimated that each person in Missouri produced about one ton (2000 pounds) of Municipal Solid Waste. About 20 percent of this waste, nearly 400 pounds, is food waste. Organic materials, such as food waste and dead plant and animal matter, naturally decompose under the proper conditions of light, air and moisture. Decomposition is nature's way of recycling the nutrients that are within the organic materials.

continued on C-2...

OUTSIDE in

Are you wondering what happened to this issue's Outside In Guide? Don't worry - you'll find it on page 11!

Worms in the Classroom

PreK-4

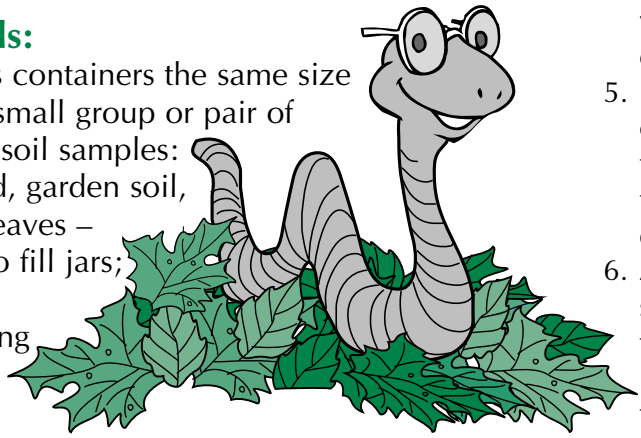
Objectives:

After completing this activity, students will be able to:

1. Describe how earthworms mix up the soil as they move through it.
2. Explain how earthworms transform plant matter into a rich soil amendment.

Materials:

Two glass containers the same size for each small group or pair of students; soil samples: clay, sand, garden soil, humus, leaves – enough to fill jars; journals; composting worms



Background:

...continued from C-1

Many living organisms help with decomposition. Earthworms are one type of decomposer that help to break down large amounts of organic matter in a short time. Each day, a worm can eat half its weight in food waste. Composting with worms, or vermicomposting, is an efficient and natural way to recycle organic food scraps.

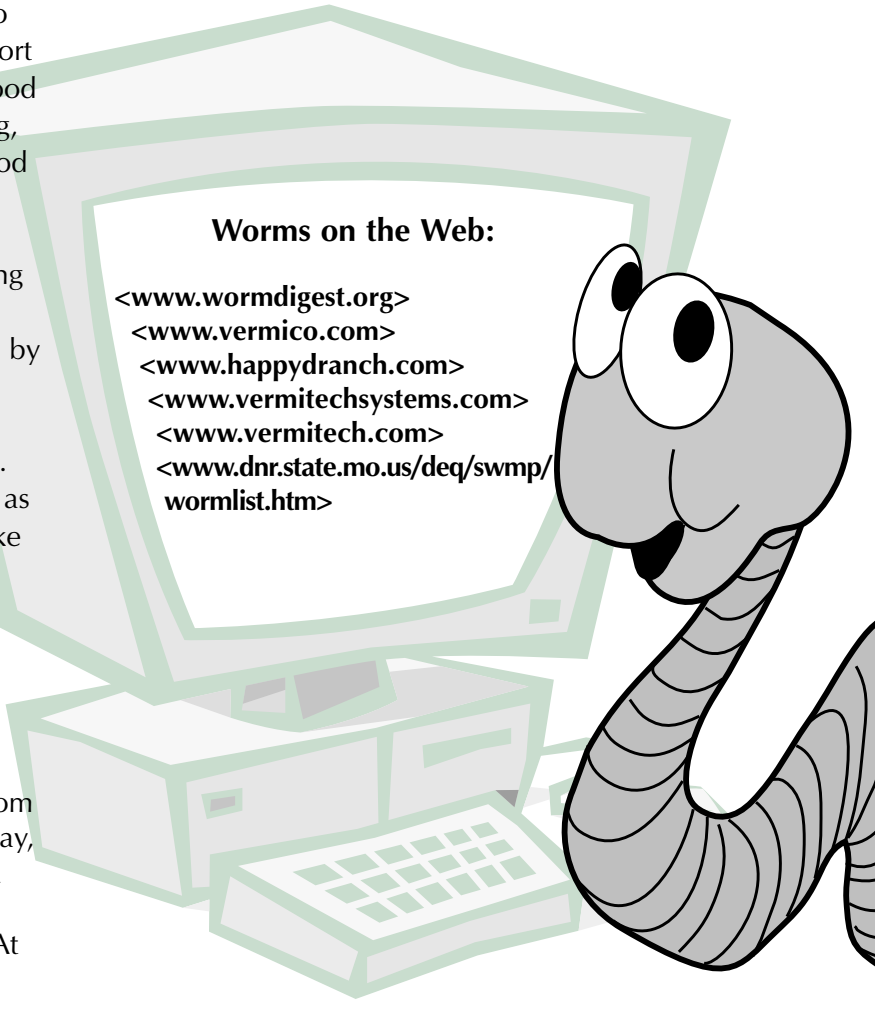
The components necessary to begin vermicomposting include a container to house the worms and their bedding material. When food waste are composted by earthworms, the resulting mixture of worm castings, organic material and bedding in various stages of decomposition, makes a wonderful soil amendment. Maintaining a worm bin in the classroom can serve as an innovative teaching aid. Teachers who would like a worm bin design sheet can find one at **<www.dnr.state.mo.us/deq/tap/pub215.pdf>**.

Procedure:

1. Obtain two glass containers the same size (wide-mouth gallon jars are ideal for this).
2. In both containers, have students layer from bottom to top an inch or two of each of the following: clay, sand, soil, humus, leaves. Label one container A and the other B.
3. Have students draw pictures of each container. At this point, both should look quite similar.
4. When students finish drawing, they may carefully place worms into container A, the variable. Feed the worms kitchen scraps or leaves. Add water to moisten the soil because worms need a moist environment. Make sure the soil stays moist! Add water, leaves and kitchen scraps to container B as well. This container will be your control. Cover each jar with black cloth or paper.
5. Each day, students can remove the coverings and observe any changes. What do they see? Can they find any tunnels? What other evidence can they find of earthworms doing their work? Have them describe their observations in words or drawings.
6. After two weeks, discuss the changes students have seen. How is the earthworm like a plow? How do the tunnels help the soil? How does the earthworm help recycle plant matter? What would happen if there were no earthworms to recycle food scraps? What is happening in the container that has no worms? How is jar A different from jar B?
7. Return the earthworms to the classroom worm bin and watch them burrow back into their home.

Worms on the Web:

<www.wormdigest.org>
<www.vermico.com>
<www.happydranch.com>
<www.vermitechsystems.com>
<www.vermitech.com>
<www.dnr.state.mo.us/deq/swmp/wormlist.htm>



The Recycle Bicycle

PreK-4

Objectives:

After completing this activity, students will be able to:

1. List or draw at least three advantages of recycling
2. Identify items that are reusable and recyclable

Materials:

Paper and pencils. Examples of recyclable materials: plastic soda bottles, milk jugs, aluminum soft-drink cans, etc.

Background:

Everything we use in our life comes from natural resources. People use natural resources to make things that are useful, like aluminum soft-drink cans, writing paper and plastic or glass containers. Aluminum cans, glass and plastic are not easily recycled in nature. It is up to people to recycle them. When you recycle you help conserve natural resources instead of throwing them away to be disposed of in a sanitary landfill.

When you hear the word "recycle," the first thought that comes to mind is tossing an unwanted item like an aluminum soft-drink can into a recycling container or taking it to a recycling center. However, recycling is more than the collection of recyclable materials. Recycling involves a **Total Recycling System** which includes purchasing for recycling, collecting for recycling, processing for recycling, manufacturing for recycling, and selling for recycling.

Procedure:

1. Write the word *recycle* on the board. Next draw a picture of a bicycle wheel. Point out that both recycle and bicycle end in the word *cycle*.
2. Explain that a bicycle goes round and round. Recycle means to use over and over again. Draw the "chasing arrows" recycling symbol on the board. Explain to them that the arrows represent collecting and processing, making products out of the recycled materials and finally, selling and buying products made from recycled materials.
3. Explain that when we recycle, the material does not add to our trash but goes back around to be made into something new. Examples include new paper products from old paper, new aluminum cans from old cans, etc.
4. Have each student list the possible advantages of recycling. Call on volunteers to read from their lists. Record the answers. Examples: **1. Saves natural resources, 2. Saves landfill space, 3. Saves money, etc.**
5. Have a show-and-tell session where the students bring in objects that are ready to be disposed of and discuss how they could be recycled or reused.

Extensions:

1. Bring several products made from recycled materials. One source for a wide variety of recycled content products is the Travelin' Trash Kit (see page C-8 for more information). Have students try to match an item that is recyclable with each product containing recycled content. For example, students could match a recycled notebook with office paper, a fleece jacket with soda bottles and a floor mat with recycled tires.
2. If you don't have one already, start a recycling program at your school. Involve students from the beginning to increase their educational experience.

Source Reduction as a First Choice

5-8

Objectives:

After completing this activity, students will be able to:

1. List reasons for source reduction
2. Compare different sizes and containers of the same product to determine which produces the least amount of waste for the lowest cost
3. Identify at least three ways shoppers can make choices that reduce waste and conserve resources
4. Collect, organize and present data

Materials:

Student Task Cards, paper and pencils, access to grocery store

Background:

Several terms are often used to mean source reduction. These include waste reduction, waste prevention and precycling. The important point is that source reduction efforts result in less waste being created, or, the idea of "preventing" waste rather than having to clean it up after it is produced.

Source reduction has many positive effects on the environment:

- Conservation of natural resources
- Reduced environmental impact from raw material extraction
- Reduced energy usage and environmental impacts from manufacturing processes
- Reduced burden on landfills (helps avoid disputes over siting new facilities)

There also are many economic benefits of source reduction, such as:

- Reduced waste management costs
- Savings in material and supply costs
- Savings from more efficient work practices (e.g., electronic mail)
- Potential revenues from selling unwanted or reusable materials

Everyone has a role to play in source reduction. Homes and businesses can reduce the amount of waste generated by not purchasing over-packaged products or those in non-recyclable containers (precycling); by repairing durable goods instead of replacing them; by buying in bulk, using refillable containers and avoiding the use of disposable products. Consumers can support manufacturers who design products that are less toxic, that require less packaging, that are recyclable, and that result in less waste at the end of their useful lives. Consumers' actions can urge merchants to stock and conspicuously mark products on the shelf that are truly environmentally friendly. Individuals can respond by purchasing those products and by expressing their preferences for them.

Procedure:

"Market Research"

(Adapted with permission from Zero Population Growth, Inc. The original activity appears in People and the Planet: Lessons for a Sustainable Future, ZPG, copyright 1996).

Advance Preparation: This activity involves either a class field trip or adult supervision of student groups visiting a grocery store after school hours. Letters of request for cooperation to local grocers and permission slips to parents are recommended.

Organize the Groups: Review the benefits of source reduction and explain the purpose of the activity. Initiate a discussion by asking about choices shoppers can make that will help conserve resources and reduce waste. Students select or are assigned to groups. Help students determine just what data they will collect and how they will organize and present the data. When the activities are completed, each group will report their conclusions to the rest of the class. Encourage further discussion for each topic, and consider other types of data that could be collected and how such information might influence their shopping habits.

"Source Reduction as a First Choice" was adapted from ReSource Your Waste *(see page C-1 for details).*

Source Reduction as a First Choice

GROUP 1 - POP SHOP

In the beverage section of the supermarket, compare various packages for the same soda pop (that is, cans vs. no-return bottles vs. returnable bottles, as well as containers of different volumes).

1. Which one is the "best buy?" Collect the data you need and calculate the cost per unit volume to support your conclusion.
2. Which one produces the least amount of after-use solid waste to dispose of or is most easily recycled?

GROUP 2 - PACKAGE BAGGAGE

In the supermarket, find one kind of non-beverage product that is packaged in different ways. Compare the different packaging formats.

1. Which one is the "best buy?"
2. Which one produces the least amount of after -use solid waste to dispose of?
3. Which type of container (and any additional packaging) allows for the best options for disposal or recycling of each type of packaging, in the interest of resource conservation?

GROUP 3 - BAG DRAG

Watch people leaving the supermarket over a period of time to record a reasonable sample (about 50) of shoppers choosing paper or plastic bags. Also record if they brought their own bags or did not use one at all.

1. Do paper and plastic bags hold an equivalent amount of items? Find out the cost of the bags to the store—who pays for them?
2. What happens to these bags after they have been used to bring home the groceries? How can each type of bag be reused or be recycled?

GROUP 4 - DISPOSER POSERS

1. Find and describe at least three items sold in the supermarket that are designed to be disposed of after only one or just a few uses.
2. Find and describe at least three items that you might purchase that are in containers you could use for other purposes (suggest other purposes!).
3. Find and describe at least three items that have packaging that is labeled as including some percentage of "post-consumer"recycled material.

C-6

What is Integrated Solid Waste Management?

9-12

Objectives:

After completing this activity, students will be able to:

1. Identify source reduction as the most preferable option in the hierarchy.
2. Explain that each option in the hierarchy has advantages and disadvantages.
3. Make waste management decisions by applying the hierarchy in a simulated industrial setting.

Materials:

Two potatoes of the same size, potato peeler and paring knife, flipchart with markers (or blackboard)

Background:

Integrated waste management is an approach where recovery, rather than loss, of the resources takes priority, and the ideal would be no waste at all. Missouri's integrated waste management options are arranged in a hierarchy of desirability, beginning with source reduction (avoiding production of the waste in the first place) and concluding with landfilling, as follows:

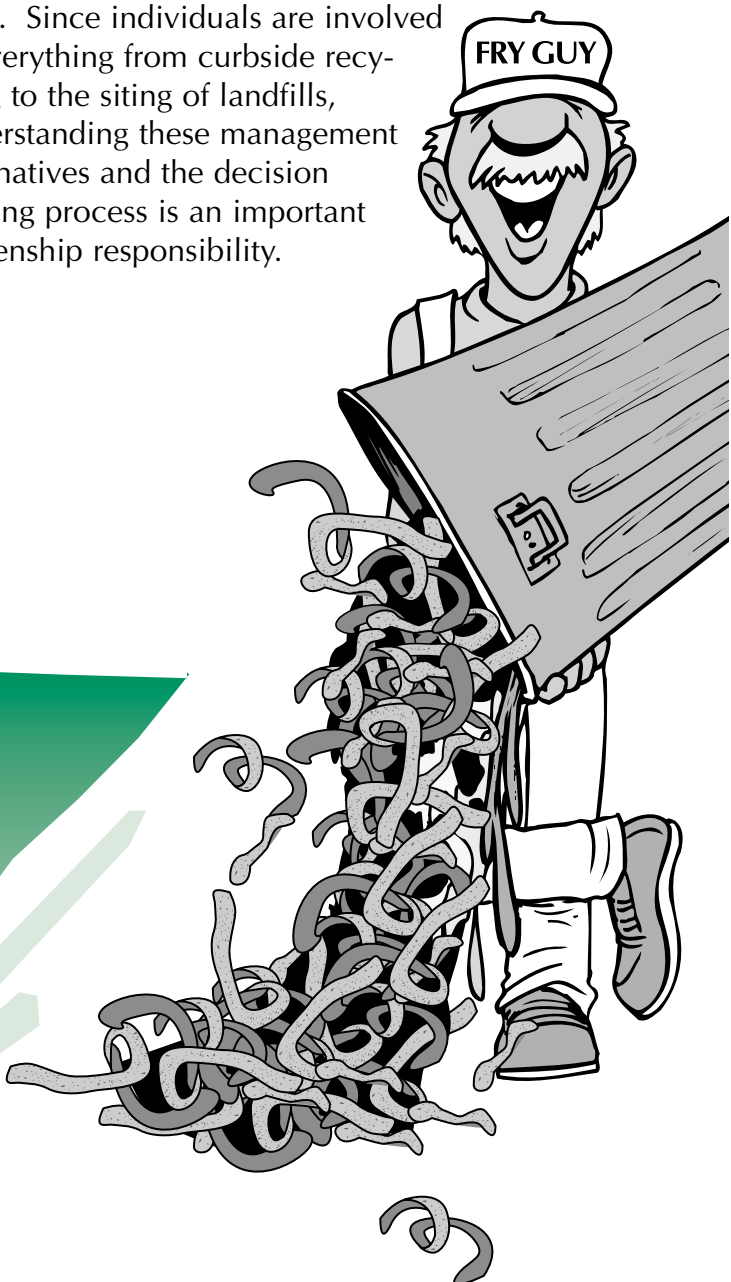
First – reduce the amount of solid waste created (waste prevention)

Second – reuse, recycle and compost

Third – recover and use energy from solid waste (waste-to-energy)

Fourth – incinerate and/or dispose of in a sanitary landfill

The key word really is "integrated." For any given waste management situation, the best solution is usually some mix or combination of these alternatives. Deciding on the "best" solution is based on an analysis of economic, social and environmental criteria for each alternative and also on the unique characteristics of the waste stream itself. Since individuals are involved in everything from curbside recycling to the siting of landfills, understanding these management alternatives and the decision making process is an important citizenship responsibility.



Procedure:

1. Review the integrated waste management hierarchy. Explain the difference between source reduction (preventing the production of waste) and management options for handling the waste after it is produced (reusing, recycling and composting).
2. Introduce the "Fry Guys Pollution Prevention Activity" as a way of applying the different parts of the integrated waste management hierarchy.
3. As a demonstration, peel the two potatoes, one with the peeler and one with a paring knife. Have students compare the two piles of peelings, noting that the knife is less efficient, wasting more of the potato and creating a greater amount of potato peelings as waste to be managed.
4. Prepare ahead of time a flipchart page as shown below. Why is "too much waste" a problem?

FRY GUYS, LTD
"Our spuds aren't duds"

Problem: Too much waste

Issues:

- Notice of violation from regulatory agency
- Expensive disposal options
- Worker exposure concerns
- Environmental concern

5. Explain that the company manufactures french fries and is having a problem with their potato peel waste. Disposal requires manifesting (keeping records), transport by a licensed potato peel hauler and disposal at a permitted potato peel disposal facility. Recently the plant received a Notice of Violation from the local potato peeling management regulators. The Fry Guys company has decided now to consider options for reducing their potato peel problem.

6. Have participants brainstorm suggestions for solutions to the company's problem while the facilitator records the ideas. Do this for about 5 minutes, until the group has covered all reasonable suggestions. After brainstorming, go back and classify each suggestion as source reduction, recycling, or disposal. See chart at bottom of page for an example.

7. Discuss the advantages and disadvantages of the ideas, particularly any advantages of source reduction options over other options. Close by reviewing how the different options of the integrated waste management hierarchy can work together in an integrated approach to waste management.

"What is Integrated Solid Waste Management?" was adapted from ReSource Your Waste *(see page C-1 for details).*

Source Reduction	Recycling	Disposal
"Do not peel at all"	Vermicomposting	Landfill
Automated Scrubber	Feed to pigs	Incineration
Develop skinless potatoes	Compost	
Trained peelers	Spread on fields	

TEACHER resources

MDNR Kids and Education <http://www.dnr.state.mo.us/kids.htm>

- Instructions to Make a Hummingbird Feeder – shows how to recycle a 2 liter soda bottle into a hummingbird feeder
- Instructions for a Recycled Bluebird House – made from scrap lumber
- Instructions for a Worm Farm Compost Box or smaller scale Worm Farm in a Quart Jar
- Three informative and entertaining articles on Worm composting
- The Teacher's Notebook from Missouri Resources magazine
- Information about Environmental Education Courses offered by the department
- Links to education publications available through the department

Travelin' Trash Kit

The Missouri Department of Natural Resources developed a kit to help educators and solid waste professionals spread the word about trash. Each kit contains:

- a copy of the MDNR solid waste curriculum, *ReSource Your Waste*
- several publications with information or activities related to solid waste and recycling copies of two MDNR videos, *Break It Down: The Compost Connection and Talkin Trash*
- over a dozen examples of recycled content products, including those containing paper, plastic, metal or rubber

These kits (45 total) have been distributed to solid waste districts and other selected sites to be made available on a check in/out basis. The kit could be used to assist a teacher with a series of lessons about solid waste or for a one-day presentation. For more information, contact Jim Lubbers, MDNR Environmental Education Unit, 800-361-4827.

Solid Waste Management Program <http://www.dnr.state.mo.us/deq/swmp/homeswmp.htm>

- Maps and lists of landfills and other solid waste processing facilities
- Publications ranging from permitting to waste reduction to tires
- A map of Missouri's twenty solid waste management districts and contact information for each
- A host of links to national solid waste organizations and other related sites

MEDIA loan list

The following videos are available by contacting the Missouri Department of Natural Resources at 800/361-4827.

Break It Down: The Compost Connection

Grades 4-8. 22 minute video.
Break It Down provides a fun learning experience filled with interesting characters, colorful visuals and an appealing guide in the person of Alice. Join her as she explores the history, general concepts and processes involved in small and large scale composting operations.

Talkin Trash: the Buy-Recycled Loop

Grades 6-8. 18 minute video.
Emphasizes the importance of closing the loop by buying products made with recycled materials. Rodney, your hip host, will take you to a landfill, recycling center and grocery store to talk about trash. Talkin Trash, along with the accompanying teacher's guide, received 3rd place in the Association for Conservation Information, Inc.'s 1993 International Education Division awards. Grades 6-8.

National Wildlife Week
April 16-28

Get ready for National Wildlife Week 2001 – a week-long celebration sponsored by the National Wildlife Federation and associated with Earth Day! Each day of NWW will highlight a particular geographical region and NWF's conservation education efforts in that area. The Midwest region (including Missouri) will be celebrated on Thursday, April 19. Broadcasts on PBS, Discovery Channel and the Travel Channel will correspond with daily activities. Visit the NWW website at **<http://www.nwf.org/wildlifeweek/index.html>** for online updates, interactive games, activity sheets, TV program guide and more!

Audubon Ecology Camp

The Burroughs Chapter sponsors teachers in the Kansas City area to attend an Audubon Ecology Camp Each summer. To receive a scholarship application, send a SASE to Kelly Gillespie, PO Box 363, Peculiar, MO 64078.

PRSRT STD.
U.S. POSTAGE PAID
MO DEPT OF CONSERVATION

Mission Statement

The Resource is published in October, December, February and April by the Office of Environmental Education. Its purpose is to provide: current information on conservation and environmental education resources and events; suggestions for integrating environmental subjects into teaching; a forum for environmental education discussion and networking in Missouri; and a clearing-house for bringing together environmental education resources and partners.

For a free subscription or to submit information to the newsletter, write to: Office of Environmental Education, Missouri Department of Conservation, P.O. Box 180 Jefferson City, MO 65102-0180.

Editors: Ginger Gray, Amy Linsenbardt and Kim Wade, Missouri Department of Conservation
Layout and Design: Firehouse Design

OFFICE OF ENVIRONMENTAL EDUCATION
Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65109-0180

CONSERVATION DEPARTMENT MISSOURI

meea
MISSOURI ENVIRONMENTAL EDUCATION ASSOCIATION

Department of Natural Resources